

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
18 August 2005 (18.08.2005)

PCT

(10) International Publication Number
WO 2005/074804 A1

(51) International Patent Classification⁷: **A61B 8/00**,
6/00, 8/08, 5/055, G06T 7/20

Québec, H2W 1T8 (CA). **UNIVERSITE JOSEPH
FOURIER** [FR/FR]; B.P. 53 - Domaine Universitaire,
F-38041 Grenoble Cédex 09 (FR).

(21) International Application Number:
PCT/CA2005/000162

(72) Inventors; and

(22) International Filing Date: 9 February 2005 (09.02.2005)

(75) Inventors/Applicants (for US only): **MAURICE, Roch**,
Liszt [CA/CA]; 260 Marineau, Bureau 301, Laval, Québec
H7X 3X1 (CA). **CLOUTIER, Guy** [CA/CA]; 221,
Chaplin, Repentigny, Québec J5Z 4J6 (CA). **OHAYON,**
Jacques [FR/FR]; 50 chemin de Coetan, F-73100
Tresserve (FR). **SOULEZ, Gilles** [CA/CA]; 18 Beloeil,
Outremont, Québec H2V 2Z2 (CA).

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2,457,171 9 February 2004 (09.02.2004) CA

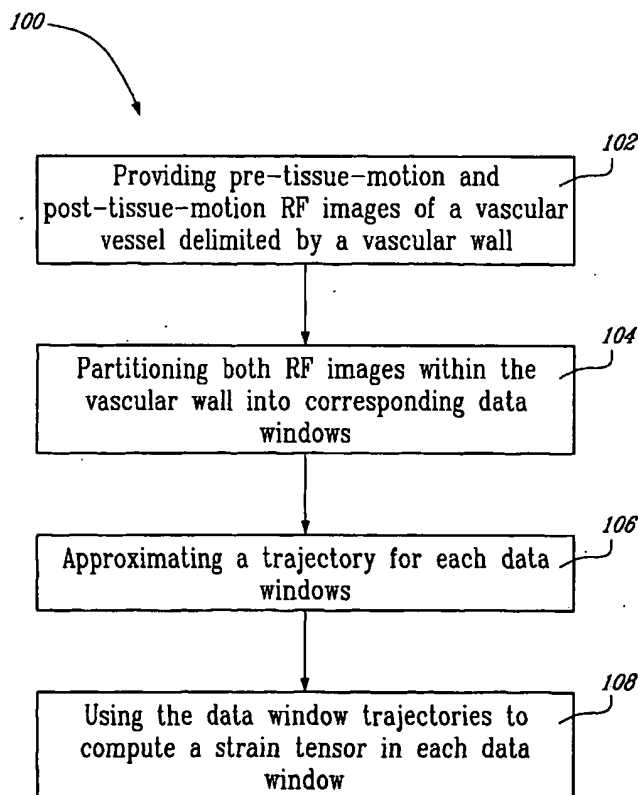
(74) Agents: **FOURNIER, Claude** et al.; BCF LLP, 1100
René-Lévesque Blvd West, 25th Floor, Montréal, Québec
H3B 5C9 (CA).

(71) Applicants (for all designated States except US):
UNIVERSITE DE MONTREAL [CA/CA]; 2900,
Edouard-Montpetit Blvd, Montréal, Québec H3T 1J4
(CA). **CENTRE HOSPITALIER DE L'UNIVERSITE
DE MONTREAL** [CA/CA]; 3850 St-Urbain, Montréal,

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,

[Continued on next page]

(54) Title: METHOD AND SYSTEM FOR VASCULAR ELASTOGRAPHY



(57) Abstract: The method for vascular elastography comprises: i) obtaining a sequence of radio-frequency (RF) images including pre-tissue-motion and post-tissue-motion images in digital form of a vessel delimited by a vascular wall; the pre-tissue-motion and post-tissue-motion images being representative of first and second time-delayed configuration, of the whole vessel; ii) partitioning both the pre-tissue-motion and post-tissue-motion images within the vascular wall into corresponding data windows; approximating a trajectory between the pre- and post-tissue-motion for corresponding data windows; and using the trajectory for each data window to compute the full strain tensor in each data window, which allow determining the Von Mises coefficient. The method can be adapted for non-invasive vascular elastography (NIVE), for non-invasive vascular micro-elastography (MicroNIVE) on small vessels, and for endovascular elastography (EVE).



GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.